# CAUSALITY BETWEEN INSTITUTIONAL QUALITY AND ECONOMIC GROWTH: EVIDENCE FROM SUB-SAHARAN AFRICA

**Jeleta Gezahegne Kebede,**
**Paul Owusu Takyi**[i]
National Graduate Institute for Policy Studies (GRIPS), Japan

**Abstract:**

This paper analyses the causal relationship between institutional quality and economic growth to investigate whether institutional quality is the outcome or the cause of economic growth in Sub-Saharan Africa. It uses annual panel data of 27 countries for the period spanning 1996 to 2014 by employing Pedroni panel co-integration, Wald panel causality, and the system GMM techniques. The co-integration test results show that there is a long-run relationship between institutional quality and economic growth. Also, the causality test results show a unidirectional causality from economic growth to institutional quality but not the other way round. Furthermore, the study found that institutional quality, trade openness, financial development, and debt positively affect economic growth. Also, economic growth and freedom are found to be important determinants of institutional quality. However, debt servicing and dependence on natural resources negatively affect economic growth and institutional quality respectively. It is, therefore, recommended that enhancement of institutional quality, openness, and financial development; while downsizing of debt servicing is crucial in achieving desired level economic growth in the region.

**JEL:** R12, O47, H63, N57, O13, F15

**Keywords:** economic growth, institutional quality, causality, co-integration

## 1. Introduction

The question of why Sub-Saharan Africa is one of the poorest regions in the world continues to be an intriguing one. The region's tardy development pace and its lack of

---

[i] Correspondence: email jaalii2007@yahoo.com, potakyi2005@gmail.com

convergence with their developed counterparts in terms of income and productivity has been academically arousing. What is readily observable is that despite the large number of studies on this question, there is no consensus among researchers on the underlying factors of this sluggish economic performance of the region. The literature is rife with several varying explanatory theories and postulations. According to Kilish et al. (2013), institutional and policy thesis, geographic thesis, cultural and historical thesis, and trade thesis have emerged in recent time to explain growth differences across African countries. According to the first thesis, Africa is poorer because of its weak institutions and due to the choice of wrong policy (Kilish et al. 2013). The literature concerned with the second thesis argues that Africa is poor because of its geographical disadvantage (Sachs, 2015; Kilish et al. 2013; Collier, 2007). According to the third thesis culture and historical antecedences are responsible for the lagging behind of growth in Africa (Kilish et al. 2013, Acemoglu, Johnson, & Robinson, 2000). The last, trade thesis, literature argues that Africa is lagging behind because it is engaging less in international trade (Kilish et al. 2013; Baltagi et al. 2009).

Interestingly, there is a growing body of literature recently that places a disproportionate emphasis on the role of institutions in explaining the growth difference across countries. In effect, this body of literature has shifted the question from "getting prices right" to "getting institutions right". The focus on institutional analysis and the underlying role of institutions in economic growth has birthed the stream of economics labeled the new institutional economics (NEI), needless to say, Douglas North's (1990) seminal work laid the foundation for the NIE. The NIE attempts to extend neoclassical economics by incorporating institutional analysis, giving attention to the due role of institutions in determining long time economic development. Kilishi et al. (2013) argue that the poor economic performance of Sub-Saharan Africa cannot be explained by the conventional neoclassical growth model. According to them institutions, are very important in explaining the economic performance of the region.

Further, they explain that during the period between 1970 and 2010, Africa's economic performance was the least compared to all other regions of the world. Excluding South Africa and Nigeria during the same period, sub-Saharan Africa experienced the least economic performance in terms of per capita income. In 2008, the sub-Saharan African and the Pacific regions ranked least in the world of regions in terms of government effectiveness. In terms of regulatory quality, sub-Saharan Africa performed only better than Central and West Asia in the same year (Zhuang et al. 2010) What is rather worthy of note is that despite the large number of studies on the effect of institutions on economic development and the effect of economic development on

institutional quality, which, between institution and economic development comes first remain a void in the literature. Put differently, there is a burning question that bothers on whether or not one, between institutions and economic development must be prioritized and mostly importantly, which of them must be prioritized over the other? This remains a yawning gap in the NIE literature and needs to be explored. Indeed, this is germane to the Institution-Economic development discourse, especially with the sub-Saharan African context, for policy reasons. An understanding of this issue could fast-pace sub-Saharan African countries' economic development and institution building. As argued by Butkiewicz and Yanikkaya (2006), "*good institutions create an environment that promotes economic activity, inventiveness, and growth and development. Bad institutions typically result in economic stagnation*". The question that is left unanswered in the region is whether institutional quality is the outcome of economic growth or the cause of economic growth. Thus, the trust of this paper is to analyze the causal relationship between institutional quality and economic growth and further throw light on the simultaneous causal effect of the far variables.

## 2. Literature Review

Economic institutions theory is premised on the existence of significant market failures resulting from economies of scale in production scope, incomplete market or absence of a market in some sectors, the prevalence of externalities, and asymmetric information in transactions. Though these market failures are common in any economy, they are more pronounced in developing countries like sub-Saharan Africa and hence calling for more public regulation (Jalilian et al. 2007). Therefore, the type of regulations in these developing countries is expected to take into account the structural and institutional characteristics of these countries so as to deploy effective regulatory mechanisms to achieve equitable and sustainable economic development. Accordingly, the outcome of a regulatory system can be assessed against efficiency and effectiveness. Effective regulation achieves goals like sustainable development and reduces poverty levels while efficient regulations achieve these set goals at minimum economic costs. According to Mundial (2001), a strong regulatory institution is a crucial determinant of economic development through its effectiveness in minimizing market imperfections. Economies with strong and developed institutional quality are able to implement effective and efficient regulations contributing to economic development. Conversely, weak and less regulatory capacity may adversely affect economic growth of a country.

North (1990) defines institutions as "rules of the game", that is, the human devised formal and informal constraints that shape human interactions. Formal

institutions refer primarily to constitutions, statutes, and explicit government rules and regulations, codified and enforced by impersonal mechanisms, most importantly, the state with its coercive power and organization. Informal institutions or constraints, on the other hand, include unwritten rules such as traditions, norms, and codes of behaviors, taboos, and other social mechanisms based and enforced through interpersonal ties and relations. One of the important challenges, in this case, is the vagueness of the concept of institution and the fact that it is multidimensional. Accordingly, identifying which dimension of an institution is more important in explaining the difference in economic performance across countries is subject to debate.

Also, according to Jalilian et al. (2007), government effectiveness and regulatory quality which are two of the six World Bank worldwide governance indicators can be used to capture regulatory institutional quality. According to them, these two variables capture both the quality of the outcome and process dimensions of regulation. The regulatory quality index can be taken as a proxy for the quality of the outcome of applying regulatory instruments as it measures the regulatory burden on business associated with inefficient quantitative controls.

Consequent to the seminal work of North (1990), several strands of thought has emerged. Some attempt to extend the neoclassical economics by incorporating institutional analysis, focusing on the role of institutions in explaining long term economic performance and hence causing economic growth (Zhuang et al. 2010). Others contend that for the reverse causality; higher economic performance has a long term institutional quality and hence causing it (Paldam & Gundlach, 2008). According to them using the causality between economic growth and corruption, it is found that causality runs from economic growth to corruption; which shows that low growth causes corruption.

The main determinant of the differences in economic growth across countries is economic institutions which are collective choices and are outcomes of political processes (Acemoglu et al. 2005). The nature of political institution and distribution of political power in a society determines economic institutions. These economic institutions not only result in different levels of economic growth through different degrees of economic efficiency but also results in different degrees of distributions of the economic gains across individuals and different social groups in a society affecting economic opportunity and allocation efficiency. Moreover, political competitions like checks and balances restrict the ability of governments to engage in rent seeking while accountability of governments to the taxpayers  leads to more business friendly and rules and regulations and hence improves government effectiveness and regulatory quality (North, 1990).

The dependence on natural resource measured by revenue from natural resource to GDP ratio is one of the main determinants of an institution of a given country. In resource-rich countries, ruling elites are likely to be particularly opposed to strengthening institutions as stronger institutions impose checks and balances that make it more difficult for them to misappropriate natural resource rents (Karl, 1997). Natural resource abundance can also have a positive effect on institutional developments via income effect. Natural resource wealth can be used to strengthen implementation capacity of governments, pursue basic business environment reforms and reduce petty corruption by improving the salary of officials and regulators.

Again, as explained by Schweinker et al. (2011), a country's openness to international economic interaction determines institutional quality. Openness to international economy creates demand for better institutions and also improves the transfer of skills and knowledge from international best practices. Education also counts as an important variable in improving institutional quality. It is argued that educated workers are very important to internalize positive externality from openness to international economy and to adapt them to domestic reality.

Empirically, Alexiou, Tsaliki, and Osman (2014) investigated the short-run and long-run relationships between institutional and economic growth in Sudan from 1972-2008.They found that the quality of the institutional environment is one of the most important factors in determining economic growth. Also, Asghar, Qureshi, and Nadeem (2015) examined the impact of institutional quality on economic growth in developing economies in Asia using a panel annual data from 1990-2013 for 13 selected developing economies. Their results of Panel ARDL show that institutional quality positively impacts economic growth. Again, their panel causality test results show that there is unidirectional causality running from institutional quality to economic growth. They, therefore, concluded that there is a need to improve institutional quality in these developing countries to ensure high economic growth. Kilishi et al. (2013) did an empirical investigation in sub-Saharan Africa to find out whether institutions really matter for growth in the region and if it does, which of them matters most? Their results show that institutions really matter for economic performance, among which regulatory quality appeared to be the most important and they recommended that economic performance of the region could be enhanced by improving regulatory quality.

Moreover, Siddiqui and Ahmed (2009) investigated the relationship between institutional quality and economic performance in Pakistan by employing the Johansen-Juselius cointegration technique and Granger causality test. The results from their cointegration test indicate that there exist a long run relationship between institutional quality and economic growth. Also, their Granger causality test results show that the

causality between institutional quality and economic growth is unidirectional with the causality running from institutional quality to economic growth. Other studies by Kauffman et al. (2005), Rodrik et al. (2004), Acemoglu, Johnson, and Robinson (2000) and Olson et al. (1998) have found evidence to support the causality from institutional quality to economic growth. Specifically, they explained that a country with better institutions leads to a higher growth rather than the causation being a reverse. Furthermore, Chong and Calderon (2000) analyzed the direction of causality between institutional measures and economic growth. They found a bidirectional causality between institutional quality and economic growth. Specifically, they found that the poorer the country, and the larger the wait, the higher the effect of institutional quality on economic growth but stated that economic growth also causes institutional quality.

From the above review, the results of the causal relationship between institutional quality and economic growth are mixed and specifically so, few studies have been conducted thin sub-Saharan Africa context. Thus, this study seeks to add to the debate in the literature on the causal relationship between the two variables and to make policy recommendations to serve as a guide for policymakers in the region.

## 3. Data and Methodology

The data set used in this study is an annual cross-country panel data comprising of 27 sub-Saharan African countries for the period spanning 1996-2014. The choice of the study period and the number of countries is based on the availability of data on the key variables of interest. The data were mainly sourced from World Bank's World Development Indicators, World Bank's Worldwide Governance Indicators and Freedom House.

The study followed Holtz-Eakin et al. (1988) and Pedroni (1999) to undertake the panel cointegration and causality tests respectively. Also, it employed the System GMM (generalized method of moments) for the estimation procedure of both the economic growth model and institutional quality model. The System GMM estimation procedure enables us to address many econometric problems like the fixed effect by considering the presence of unobserved country specific effects due to differences in initial conditions or possible omitted variable bias which is persistent over time (Bond et al, 2001). Moreover, according to Sot (2009), by exploiting the time series dimension, system GMM increases the degree of freedom and reduces collinearity between variables leading to more efficiency of the estimates. In addition to this, the system GMM is preferred to other estimation procedures like standard GMM in growth models as the instruments used in standard GMM may behave poorly when explanatory

variables present a strong autoregressive component such as income or capital and hence using system GMM estimation leads to lower bias and more efficiency.

## 3.1 Co-integration and Causality tests

This study employs panel co-integration test which is developed by Pedroni (1999). This test provides a technique that enables us to use panel data and also overcome the problems related to small a sample. Moreover, it has the advantages of taking into account the heterogeneity in the intercepts and slopes of the co-integrating equation.

By follow Holtz-Eakin et al. (1988), equations (1) and (2) is estimated to carry out the panel causality test.

$$\Delta \ln GDPC_{i,t} = \gamma_0 + \sum_{k=1}^{n} \lambda_k \Delta \ln GDPCY_{i,t-k} + \sum_{j=1}^{m} \delta_j \Delta \ln INST_{i,t-j} + \omega_i + u_{i,t} \qquad (1)$$

$$\Delta \ln INST_{i,t} = \pi_0 + \sum_{j=1}^{m} \eta_j \Delta \ln INST_{i,t-j} + \sum_{k=1}^{n} \varphi_k \Delta \ln GDPC_{i,t-k} + \theta_i + \xi_{i,t} \qquad (2)$$

Where, $\lambda_k, \delta_j, \eta_j$ and $\varphi_k$ are coefficients of the respective variables. Also, $\varpi_i$ and $\theta_i$ are individual specific effects of the countries whereas, whiles $u_{i,t}$ and $\xi_{i,t}$ are the error terms under the two equations for *GDPC* and *INST* respectively. The causal relationship is undertaken using the Wald causality test between the two variables under both equations independently.

## 3.2 Empirical model for economic growth and institutional quality

We followed the theoretical framework based on human capital augmented neoclassical model which was developed by Mankiw et al. (1992) and adopted it so that the role of institutions can be captured by including institutional quality. Also, the institutional quality equation is modelled after Jonathan et al. (2014) and Antonia et al. (2010). Macroeconomic variables which are theoretically supported to be determinants of economic growth and institutional quality such as financial development, education, investment, debt, trade openness, population growth rate, and inflation are also incorporated. As system GMM is dynamic model in nature, the lags of both economic growth and institutional quality are also included. Accordingly, the empirical regression model for economic growth and institutional quality are respectively shown in equations (3) and (4):

$$\ln GDPC_{i,t} = \beta_0 + \sum_{k=1}^{n} \beta_{1k} \ln GDPC_{i,t-k} + \beta_2 \ln INST_{i,t} + \beta_3 \ln INF_{i,t} + \beta_4 \ln DEBT_{i,t}$$

$$+ \beta_5 \ln INVT_{i,t} + \beta_6 \ln OPEN_{i,t} + \beta_7 \ln AUGL_{i,t} + \beta_8 \ln FIND_{i,t} + \pi_i + v_{i,t} \qquad (3)$$

$$\ln INST_{i,t} = \phi_0 + \sum_{k=1}^{m} \phi_{1k} \ln INST_{i,t-k} + \phi_2 \ln GDPC_{i,t} + \phi_3 \ln PLCV_{i,t} + \phi_4 \ln NARE_{i,t}$$

$$+\phi_5 \ln EDUC_{i,t} + \phi_6 \ln OPEN_{i,t} + \phi_7 \ln FIND_{i,t} + \delta_i + \varepsilon_{i,t} \qquad (4)$$

Where $i$ represents individual countries, $t$ is time, $\ln$ is natural log, $\pi_i$ and $\delta_i$ capture the individual country's fixed effect with $\beta_1$ through $\beta_8$, and $\phi_1$ through $\phi_7$ being the elasticity coefficients to be estimated. Here, *GDPC* is GDP (Gross Domestic Product) per capita used as a proxy for economic growth, *INST* is institutional quality proxied by the index of government effectiveness and regulatory quality, *NARE* is natural resource measured by total natural resource revenue to GDP ratio used as proxy for dependence on natural resource and *FIND* is financial development measured by domestic credit to private sector to GDP ratio. Also, *DEBT* is external debt servicing to export ratio, *INF* is inflation measured as consumer price index in constant of 2010 US Dollar, *INVT* is investment measured by fixed capital formation as a percentage to GDP ratio, *EDUC* is education as proxy for human capital measured by public expenditure on education to GDP ratio, *PLCV* freedom measured by index of political right and civil liberty, and *AUGL* is augmented population growth.

## 4. Results and Discussion

### 4.1 Panel Unit root test

The results of the panel unit root test shown in Table 1 indicate that all variables with the exception lnAUGL and lnNARE are non-stationary at their levels but stationary after first difference.

**Table 1:** Panel unit root test results

| Variable | Level | | First Difference | |
| --- | --- | --- | --- | --- |
| | Without time trend | With time trend | Without time trend | With time trend |
| lnGDPC | 5.567.6 | 0.59422 | -6.57351*** | -5.56550*** |
| lnINST | 0.93931 | 2.76707 | -9.59932*** | -6.42704*** |
| lnOPEN | 0.25342 | -0.68531 | -9.37450*** | -6.63258*** |
| lnFIND | 1.03170 | 0.05186 | -7.34760*** | -4.92551*** |
| lnINF | 6.19413 | 0.28936 | -8.35313*** | -7.10110*** |
| lnAUGL | -16.2666*** | -21.1282*** | - | - |
| lnEDUC | -0.88434 | -0.31442 | -2.89365*** | -0.54596*** |
| lnDEBT | 2.44446 | 1.49555 | -5.33755*** | -2.27833** |
| lnINVT | 0.39667 | 0.77163 | -8.29627*** | -6.39250*** |
| lnNARE | -2.51161*** | -2.31033** | - | - |

Note: *** and ** indicate the rejection of the null hypothesis of non-stationary at 1% and 5% significance level respectively

## 4.2 Co-integration and causality test

The co-integration results in Table 2 shows that there is long run relationship between economic growth and institutional quality. The fact that they have long run relationship implies that there is at least one directional causality between the two. However, co-integration result doesn't tell us the direction of the causality. Thus, we conducted a causality test and the results are shown in Table 3.

**Table 2:** Co-integration test results between institutional quality and economic growth

| | | | Weighted | |
| --- | --- | --- | --- | --- |
| | **Statistic** | **Prob.** | **Statistic** | **Prob.** |
| Panel v-Statistic | -2.562577 | [0.9948] | -1.593141 | [0.9444] |
| Panel rho-Statistic | -17.63280 | [0.0000]*** | -13.05994 | [0.0000]*** |
| Panel PP-Statistic | -46.56612 | [0.000]*** | -27.11115 | [0.00000]** |
| Panel ADF-Statistic | -3.083803 | [0.0010]** | 1.012981 | [0.8445] |
| Group rho-Statistic | -9.058288 | [0.000]*** | | |
| Group PP-Statistic | -29.70497 | [0.000]*** | | |
| Group ADF-Statistic | 1.916275 | [0.9723] | | |

Note: *** and ** indicate the rejection of the null hypothesis of no long-run relationship at 1% and 5% significance level respectively

The causality result is discussed by dividing the analysis into different cases depending on per capita income levels. First, the causality test is undertaken for the whole sample. Then, it is undertaken by dividing the countries into 14 low income countries and 13 middle income countries. Finally, the causality test is done by categorizing the middle income countries into 10 lower middle income countries and 3 upper middle income countries. Classifying this way and considering case by case enables us to consider if the direction of causality between economic growth and institutional quality changes across countries with different level of economic performance.

The causality result for the whole sample shows that we fail to reject the null hypothesis that institutional quality does not cause economic growth. On the contrary, we reject the null hypothesis that economic growth does not cause institutional quality at 5% level of significance. These two results show that the causality is unidirectional, running from economic growth to institutional quality and not the other way round.

We conduct further analysis by classifying the countries into two low-income and middle-income countries to ascertain whether or not the result of causality between economic growth and institutional quality changes. It is evident from this analysis that we fail to reject the null that the institutional quality doesn't cause economic growth but reject the null that economic growth does not cause institutional quality under both low-income countries and middle-income countries implying that the result shows

unidirectional causality running from economic growth to institutional quality and not the other way round. Causality analysis is further undertaken by dividing the middle income countries into lower middle-income countries and upper-middle income countries.

The test result shows that under both lower middle income and upper middle income countries cases, we fail to reject the null that institutional quality does not cause economic growth but reject the null that economic growth causes institutional quality. This implies that institutional quality does not have a lasting effect on economic growth. In other words, economic growth at a given time period is not significantly affected by the long term past institutional quality in the region. Generally, the causality analysis shows that the causality runs unidirectional from economic growth to institutional quality in all the cases. This result concurs with the predictions by Paldam and Gundlach (2008) who explained that higher level of economic development (growth) generates the need for and lead to better institutions.

Also, the causality from economic growth to institutional quality is in line with the findings by Chong and Calderon (2000).

**Table 3:** Results of causality test between economic growth and institutional quality

|  |  | Null hypothesis | |
|---|---|---|---|
|  |  | Institutional quality does not cause growth | Economic growth does not cause institutional quality |
| All sample | $\chi^2$ | [2.53334] | [3.75390] |
| countries | p-value | [0.8137] | [0.0167]** |
| Low | $\chi^2$ | [2.67220] | [3.98077] |
| income | p-value | [0.7290] | [0.0442]** |
| Middle | $\chi^2$ | [1.63836] | [11.7253] |
| income | p-value | [0.3426] | [0.0000]*** |
| Lower middle | $\chi^2$ | [1.96536] | [11.0856] |
| income | p-value | [0.1633] | [0.0000]*** |
| Upper middle | $\chi^2$ | [0.54838] | [13.8574] |
| income | p-value | [0.5689] | [0.0000]*** |

Note: *** and ** indicate the rejection of the null hypothesis of no causality at 1% and 5% significance level respectively.

## 4.3. Effect of institutional quality on economic growth

Table 4 reports the regression results of the effect of institutional quality on economic growth. It can be seen that the coefficients of the first and second lags of economic growth are both positive and statistically significant at 1% level of significance. This implies that current growth responds to previous economic performance. Also, the

coefficient of institutional quality, which is the main variable of interest, is positive and statistically significant at 1% level of significance. This means that improvement in institutional quality improves the economic growth in the region. This result is in line with what has been found by some authors in the literature (Asghar, Qureshi, & Nadeem, 2015; Alexiou, Tsaliki, & Osman, 2014; Kilish et al. 2013; Fabro & Aixalá, 2009; Kandil, 2009). However, from the causality test results in Table 3, institutional quality does not cause economic growth which poses a question which is beyond the scope of this paper as to why institutional quality is a significant determinant of economic growth but doesn't have lasting effect in the long run on economic growth in the region.

Moreover, openness which is a proxy for the region's economic interaction with the rest of the world has its coefficient being positive and statistically significant at 1% level of significance. This implies that the more the region is integrated with the rest of the world economically, the more its economic activities improves. Also, financial development which measures financial deepening is found to be a significant determinant of economic growth at 10% significant level indicating that improving financial deepening is beneficial for economic growth. Furthermore, debt proxied by the external debt servicing to gross domestic product ratio is found to be a negative and a significant determinant of economic growth at 10% implying that debt servicing is negatively affecting the economic growth in the region.

**Table 4:** GMM estimation results of institutional quality and economic growth

Dependent Variable: lnGDPC

| Regressor | Coefficient | Standard Error | Z | P-values |
|---|---|---|---|---|
| lnGDPC(-1) | 0.8272993*** | 0.0551429 | 15.00 | [0.000] |
| lnGDPC(-2) | 0.149229*** | 0.0547068 | 2.73 | [0.006] |
| LnINST | 0.0422489*** | 0.0123807 | 3.41 | [0.001] |
| LnINF | -0.0054274 | 0.0079408 | -0.68 | [0.494] |
| LnDEBT | -0.0099858*** | 0.0036594 | -2.73 | [0.006] |
| LnINVT | 0.0148993 | 0.0095872 | 1.55 | [0.120] |
| LnOPEN | 0.0348734*** | 0.0112666 | 3.10 | [0.002] |
| LnAUGL | -0.0015494 | 0.008458 | -0.18 | [0.855] |
| LnFIND | 0.0137603* | 0.0071322 | 1.93 | [0.054] |
| Constant | 0.1035212 | 0.0887966 | 1.17 | [0.244] |

AR(1), p-value: [0.0519]*    AR(2), p-value: [0.2898],

Sargan test, p-value: [0.5640]

Note: ***, **, and * denote significance level at 1%, 5% and 10% respectively

## 4.4. Effect of economic growth on institutional quality

The results of the impact of economic growth on institutional quality are displayed in Table 5. From the results, the coefficients of the first and second lags of institutional quality are both positive and statistically significant at 1% level of significance. Economic growth, which is the variable of interest, has its coefficient being positive and statistically significant at 10% level of significance. This means that institutional quality responds positively to the improvement in economic growth. Thus, economic growth is accompanied by institutional improvements and this result is consistent with most empirical finding in the literature (Alonso & Garcimartín, 2013; Fabro & Aixalá, 2009; Rigobon & Rodrik, 2004; Islam & Montenegro, 2002).

**Table 5:** GMM estimation results of economic growth and institutional quality

| Dependent Variable: lnINST | | | | |
|---|---|---|---|---|
| **Regressor** | **Coefficient** | **Standard Error** | **Z** | **P-values** |
| lnINST(-1) | 0.6540217*** | 0.1130693 | 5.78 | [0.000] |
| lnINST(-2) | 0.2253973** | 0.0992179 | 2.27 | [0.023] |
| lnGDPC | 0.024255* | 0.0142306 | 1.70 | [0.088] |
| lnPLCV | 0.038326 * | 0.0216463 | 1.77 | [0.077] |
| lnNARE | -0.0097048* | 0.0052095 | -1.86 | [0.062] |
| lnEDUC | 0.0026191 | 0.0243669 | 0.11 | [0.914] |
| lnOPEN | -0.0109518 | 0.0278528 | -0.39 | [0.694] |
| lnFIND | -0.0275056 | 0.0190633 | -1.44 | [0.149] |
| Constant | -0.2837768* | 0.1663272 | -1.71 | [0.088] |
| AR(1), p-value: [0.0534]* AR(2), p-value: [0.3050] | | | | |
| Sargan test, p-value: [0.4033] | | | | |

Note: ***, **, and * denote significance level at 1%, 5% and 10% respectively

In addition, the coefficient of freedom is positive and statistically significant at 10% significance level which means institutional quality positively responds to freedom and right and civil liberty. Moreover, natural resource is found to be a negative and a significant determinant of institutional quality at 10% significance level. Thus, dependence on natural resource is undermining the development of institutional quality in the region.

## 5. Conclusion and policy recommendation

There are ample evidences which show that sub-Saharan African countries are among the least performing economies when measured in terms of per capita income. The region is also classified among regions with least institutional quality in the world. The

fact that there are sound theoretical and empirical arguments on the relationship between economic growth and institutional quality poses a question on why this region performs poorly in terms of both variables and what policy measure to follow if it wants to improve them. Following from this, this paper addresses the nature of the relationship between economic growth and institutional quality and their respective determinants in sub-Saharan countries using 27 countries: 14 low income, 13 middle income (10 lower middle income and 3 upper middle income) countries from 1996 to 2014.

Using system GMM, the economic growth and institutional quality are modeled independently so as to understand what determines them in the region. Accordingly, the economic growth model shows that its own lags, institutional quality, openness to the rest of the world economy and financial development positively and significantly affect economic growth whereas debt servicing negatively affects it. The finding for the institutional model shows that its own lags, economic growth, and freedom positively affect institutional quality whereas dependence on natural resource affects institutional quality negatively. Also, the panel co-integration test result shows that economic growth and institutional quality are co-integrated in the long run implying the existence of long-run relationship between them. Moreover, the Wald causality test result shows that there is a unidirectional causality between the two variables with the causality running from economic growth to institutional quality.

From the discussions above, it recommended that policies to enhance institutional quality, openness, and financial development; while policies to reduce debt servicing to achieve desired economic growth are paramount. Also, there is the need to design appropriate policies that promote economic growth (as institutional quality responds positively to the improvement in economic growth) and enhance freedom; and policies which reduce the dependence on natural resources to bring about the desired level of institutional quality. Therefore, African countries need to concentrate on policies to promote growth first since growth enhances institutional quality.

## References

1. Acemoglu, D., Johnson, S., & Robinson, J. A. (2000). *The colonial origins of comparative development: An empirical investigation* (No. w7771). National bureau of economic research.
2. Acemoglu, D., Johnson, S., & Robinson, J. A. (2005). Institutions as a fundamental cause of long-run growth. *Handbook of economic growth, 1*, 385-472

3. Alexiou, C., Tsaliki, P., & Osman, H. R. (2014). Institutional quality and economic growth: Empirical evidence from the Sudanese economy. *Economic Annals*, *59*(203), 119-137.

4. Alonso, J. A., & Garcimartín, C. (2013). The determinants of institutional quality. More on the debate. *Journal of International Development*, *25*(2), 206-226.

5. Asghar, N., Qureshi, S., & Nadeem, M. (2015). Institutional Quality and Economic Growth: Panel ARDL Analysis for Selected Developing Economies of Asia. *South Asian Studies*, *30*(2), 381-403.

6. Baltagi, B. H., Demetriades, P. O., & Law, S. H. (2009). Financial development and openness: Evidence from panel data. *Journal of development economics*, *89*(2), 285-296.

7. Bond, S. R., Hoeffler, A., & Temple, J. R. (2001). GMM estimation of empirical growth models.

8. Butkiewicz, J. L., & Yanikkaya, H. (2006). Institutional quality and economic growth: Maintenance of the rule of law or democratic institutions, or both?. *Economic Modelling*, *23*(4), 648-661.

9. Choi, I. (2001). Unit root tests for panel data. *Journal of international money and Finance*, *20*(2), 249-272.

10. Chong, A., & Calderon, C. (2000). Causality and feedback between institutional measures and economic growth. *Economics & Politics*, *12*(1), 69-81.

11. Collier, P. (2007). Bottom billion. The Wiley-Blackwell Encyclopedia of Globalization.

12. Fabro, G., & Aixalá, J. (2009). Economic Growth and Institutional Quality: Global and Income-Level Analyses. *Journal of economic issues*, *43*(4), 997-1023.

13. Gujarati, D. (2004). Basic Econometrics. United States Military Academy, West Point.

14. Gundlach, E., & Paldam, M. (2008). *The Democratic Transition. A study of the causality between income and the Gastil democracy index* (No. 2008-15).

15. Hadri, K. (2000). Testing for stationarity in heterogeneous panel data. *The Econometrics Journal*, *3*(2), 148-161.

16. Holtz-Eakin, D., Newey, W., & Rosen, H. S. (1988). Estimating vector autoregressions with panel data. *Econometrica: Journal of the Econometric Society*, 1371-1395

17. Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of econometrics*, *115*(1), 53-74.

18. Islam, R., & Montenegro, C. E. (2002). *What Determines the Quality of Institutions?* World Bank Policy Research Working Paper No. 2764.

19. Jalilian, H., Kirkpatrick, C., & Parker, D. (2007). The impact of regulation on economic growth in developing countries: A cross-country analysis. *World development*, *35*(1), 87-103.

20. Kandil, M. (2009). Determinants of institutional quality and their impact on economic growth in the MENA region. *International Journal of Development Issues*, *8*(2), 134-167.

21. Karl, T. L. (1997). *The paradox of plenty: Oil booms and petro-states* (Vol. 26). University of California Press.

22. Kaufmann, D., Kraay, A., & Mastruzzi, M. (2005). Governance Matters IV: Governance Indicators for 1996-2004', World Bank Policy Research Working Paper No. 3630, Washington, DC: World Bank.

23. Kilishi, A. A., Mobolaji, H. I., Yaru, M. A., & Yakubu, A. T. (2013). Institutions and Economic Performance in Sub-Saharan Africa: A Dynamic Panel Data Analysis. *Journal of African Development*, *15*(2), 91-119.

24. Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *The quarterly journal of economics*, *107*(2), 407-437.

25. Mundial, B. (2001). World development report 2002: building institutions for markets. *Washington: Banco Mundial*.

26. North, D. C. (1990). *Institutions, institutional change, and economic performance*. Cambridge university press.

27. Olson, M., Sarna, N., & Swamy, A. V. (1998). Governance and Growth: A Simple Hypothesis Explaining Cross-country Differences in Productivity Growth, University of Maryland. *Center for Institutional Reform and the Informal Sector, IRIS Working Paper*, (218).

28. Paldam, M., & Gundlach, E. (2008). Two views on institutions and development: the grand transition vs the primacy of institutions. *Kyklos*, *61*(1), 65-100.

29. Pedroni, P. (1999). Critical values for cointegration tests in heterogeneous panels with multiple regressors. *Oxford Bulletin of Economics and statistics*, *61*(s 1), 653-670.

30. Rigobon, R., & Rodrik, D. (2004). *Rule of law, democracy, openness, and income: Estimating the interrelationships* (No. w10750). National Bureau of Economic Research.

31. Rodrik, D., Subramanian, A., & Trebbi, F. (2004). Institutions rule: the primacy of institutions over geography and integration in economic development. *Journal of economic growth*, *9*(2), 131-165.

32. Sachs, J. D. (2015). The age of sustainable development. Columbia University Press.

33. Schweickert, R., Melnykovska, I., Belke, A., & Bordon, I. (2011). Prospective NATO or EU membership and institutional change in transition countries. *Economics of Transition*, *19*(4), 667-692.

*34.* Siddiqui, D. A., & Ahmed, Q. M. (2009). *The causal relationship between institutions and economic growth: An empirical investigation for Pakistan economy*. MPRA Paper No. 19745.

35. Soto, M. (2009): System GMM Estimation with a Small Sample.

36. Zhuang, J., de Dios, E., & Martin, A. L. (2010). Governance and institutional quality and the links with economic growth and income inequality: With special reference to developing Asia.

**Appendix 1**: Countries

| Low income | Lower middle income | Upper middle income |
|---|---|---|
| Benin | Cote d'Ivoire | Botswana |
| Burkina Faso | Cameroon | Gabon |
| Burundi | Congo, Rep. | Mauritius |
| Congo, Dem. | Ghana | |
| Kenya | Lesotho | |
| Madagascar | Mauritania | |
| Mali | Senegal | |
| Mozambique | Sudan | |
| Malawi | Swaziland | |
| Niger | Zambia | |
| Rwanda | | |
| Tanzania | | |
| Togo | | |
| Uganda | | |

Source: World Bank list of economies (July 2016)